Governor's Upper Yellowstone River Task Force
Meeting Summary
January 7, 2003
Yellowstone Inn
Meeting began at 7:00 p.m.

I. Introductions

Members Present:
John Bailey, Chair
Dave Haug, Vice Chair
Roy Aserlind
Andy Dana
Doug Ensign
Michelle Goodwine
Jerry O'Hair
Brant Oswald
Bob Wiltshire
Ellen Woodbury
Jim Woodhull

Ken Britton, USFS Ex-Officio
Tom Olliff, YNP Ex-Officio
Robert Ray, DEQ Ex-Officio
Laurence Siroky, DNRC Ex-Officio
Allan Steinle, Corps Ex-Officio
Stan Sternberg, MDT Ex-Officio
Joel Tohtz, FWP Ex-Officio

Others Present:
Liz Galli-Noble, Coordinator
Kelly Wade, Secretary
Duncan Patten, TAC Chair
Deon Lackey
Lurah Klaas
Jim Robinson
Patty Bean
Kay Blehm
Peter Ismert
Al Zale
Karl Biastoch
Brad Shepard
Jim Barrett
Daryl Smith
Mike Merigliano
Chuck Dalby
Joe Fider
George Jordan
Mary Louise Polzin
Lionel Dicharry
Bill Moser
Thomas Hallin
Diane Taliaferro
Tom Pick
Mike Gilbert
Paul Hook
M.E. Johnstad
Bruce Rich
Burt Williams
Yolanda Young
Tracy Peterson
Denise Fitz
Dennis Flath
Steve Caldwell
Laura Hubbard
Julia Page
Scott Bosse
Doug Rider

II. Prior Meeting Minutes

John Bailey: Any discussion on the minutes of December 12, 2002?

Bob Wiltshire moved to approve the December 12, 2002 minutes as written. Ellen Woodbury seconded the motion. The motion passed unanimously.

III. Financial Updates

Liz Galli-Noble reported on the following:

EXPENDED GRANTS			
Grant Name	**Completed**	**Amount**	**Study Component**
DNRC Watershed Planning Assistance Grant	6/30/99	2,100.00	Physical Features Inventory
DNRC HB223 Grant	7/30/99	10,000.00	Aerial photography
DNRC Riparian/Wetlands Educational Grant	6/30/00	960.99	*Hydrologic Response to the 1988 Fires* Workshop
DEQ 319 Grant (1st)	9/30/00	40,000.00	Coordinator position
DNRC Watershed Planning Assistance Grant	1/31/01	10,000.00	Watershed Land Use Study
DEQ Start-Up Grant	6/26/01	49,138.00	Coordinator position, Admin secretary, additional cross-sections, operating expenses.
DNRC HB223	10/1/01	6,500.00	Riparian Trend Analysis
BLM Funding	10/26/01	10,000.00	Wildlife Study
DEQ 319 Grant (2nd)	3/21/02	58,000.00	Coordinator position
DEQ 319 Grant (3rd)	9/30/02	44,000.00	Coordinator position
EPA RGI Grant	12/20/02	30,000.00	Geomorphology study

CURRENT GRANTS			
Grant Name	**Amount**	**Spent**	**Remaining Balance**
DNRC RDGP Grant (expires 7/03)	299,940.00	290,615.34	9,324.66
DEQ 319 Grant (4th) (expires 3/04)	122,200.00	23,713.61	98,486.39

IV. Research Presentation #5. Riparian Trends Study

NOTE: This presentation was videotaped and may be viewed upon request. Contact the Task Force coordinator if you wish to borrow the videotape.

1. Introduction

John Bailey: Before I introduce Duncan Patten, who will introduce the researchers, I want to review the formal presentation process that the Task Force has adopted. We ask that there be no questions or interruptions while the researchers are giving their presentation. There will be two presenters tonight. There will be no questions until they are both done. Once they are done, we will take questions; questions from the Task Force will be taken first, and then we allow people from the audience—the public—to ask questions. I want to stress that your questions can only be related to the research that is presented. If questions are asked by either the Task Force or the public that relate to other things, as Chair, I have been asked to cut them off. After we have completed the question and answer session, we will then go into the general discussion session. Again, the Task Force will be asked to make comments first, and then the public will be asked to comment. We've used this format in all the studies that have been given to date, and it has worked quite well. But please remember, on that first part, to the researchers, you can only ask questions relating to their research. Now I'm going to introduce Dr. Duncan Patten, who heads the Technical Advisory Committee, and he will introduce the researchers.

Duncan Patten: We've gradually moved through the physical processes in the last few presentations that we've had, and now we're getting into the biological realm of the studies. From here on, if you look at the list of presentations—after today's on the riparian vegetation—we get into fish, wildlife, then back to fish, and eventually into historic land use, which really puts many of the pieces together. As a riparian ecologist, to me this is probably the most interesting of all the talks. I say that somewhat jokingly, but I also want to emphasize that vegetation is often the integrator of the physical processes and also the linkage between the physical process, the physical system, and other biological systems, the wildlife habitat, and also it even produces habitat for aquatic organisms and the like. So, tonight we are hearing various components of the Riparian Trend Study, which deals with everything from channel migration, to aging of the cottonwood population, to other aspects of riparian vegetation. I won't get into the details but instead will allow our presenter to do so. So tonight we have Dr. Mike Merigliano, who's at the University of Montana and the study leader, and Mary Louise Polzin, who's a Ph.D. student at the University of Montana and has been working with him on the study for the last couple of years. I'm also on Mary Louise's Ph.D. committee, so I'll learn a lot today about what she's doing.

2. Riparian Trend Analysis Power Point Presentation

See *Attachment A. Temporal patterns of channel migration, fluvial events, and associated vegetation along the Yellowstone River, Montana, Parts I and II.*

3. Question and Answer Session

John Bailey: We will take questions from the Task Force first.

Jerry O'Hair: In your research, did you find a correlation between the age of cottonwood trees and the flood years?

Mary Louise Polzin: I did look at that, and initially I looked at all of the trees that I aged for the floodplain turnover, and I didn't find any correlation to that. But I'm thinking that if maybe I just look at the oldest trees for each of the age classes—because of all this clonal activity and all this confusion on the ages—I'm hoping that maybe if I look at just the oldest trees for each age class there is some correlation to the flood plain and to the flood flows, but I haven't done that yet. But I'm hoping to find it, at least there should be a correlation there, but I haven't found it yet.

Jerry O'Hair: Well how native do you think cottonwoods are to this area? Do you know if they have been around for 300, 400, 500 years? Is that something that the study can figure out, whether they are actually native or have they come-in in later years?

Mary Louise Polzin: The oldest tree I cored was 384 years old, and of course with that there is probably a ten percent error rate, so you know it's not going to be exactly 384. It is very unusual for cottonwoods to live that long, they have to have just the right conditions and everything. You're not going to find a whole lot of representatives from that age class because usually there's a very dynamic system and they've been taken away with the flood flows, or they just die of old age and the land is too high (has built up) and they don't get recolonized.

Andy Dana: If cloning activity is so important, why is it important to find a correlation between the flood events that Jerry was talking about and cottonwood establishment?

Mary Louise Polzin: Because if there is a correlation between those two, you could use that information on systems where there is a dam, where you can regulate flows, and you may be able to allow a flow that isn't high enough to promote seedling recruitment but it will promote root suckering.

Andy Dana: But it's not important necessarily to this system?

Mary Louise Polzin: Right, but that information gained from a natural system can be used on other restoration projects and also may be useful for an area that has a declining water table, where the land is getting built up (higher and higher) and it gets drier and drier, and you start to lose cottonwoods, where eventually they are dying out. But there might be some kind of irrigation system or something like that, if you wanted to try and keep them there, it might be helpful. I don't know, it's purely theoretical.

Mike Merigliano: I may be able to add a little bit to Jerry's question. Jerry asked about how long cottonwoods have been in the system, and if they're native. There's a study in Yellowstone area and cottonwood shows up in the pollen record as being around in the thousands of years. They have been around a very long time.

Laurence Siroky: On one slide you showed an overlay of the floods that have occurred historically. Are you going to do that for rainfall as well?

Mary Louise Polzin: I'll look at the rainfall events to see what kinds of events are associated with peak flows. Whether they're rain on snow events, large rainstorms, what kind of conditions are initiating these flood events. Is that what you mean?

Laurence Siroky: Yeah, I guess I am asking if you are going to examine the climatic factors that would contribute to the different ages as well as the flood flows?

Mary Louise Polzin: Right. It is connected to the flood flows. What kinds of weather conditions initiate those kinds of flood flows. I, too, am interested as to whether or not different weather conditions are connected to clonal activity or not. Maybe wet years are what's initiating it, and not the river flood flows. So, definitely climate in the river system needs to be looked into as well, but I haven't done it yet.

Laurence Siroky: But you are going to be doing it?

Mary Louise Polzin: Yes.

Roy Aserlind: In your report, you utilized the stratification term "wetted channel". Now are you referring to a channel with water in it that's a particular time of your study or the banks at a flood stage?

Mike Merigliano: The wetted channel is what was wetted on that photo. The wetted channel is just as you thought, it's what shows on the photo, and then when we talk about the active channel, it is what is basically occupied by plants.

Roy Aserlind: When you mention decay, exactly what do you mean by that? Just change, is change equal to decay, or is it loss?

Mike Merigliano: Yeah. Especially when there's new land created for seedlings, and if there is no change in channel width and the floodplain limits are the same, something's got to go. And it's typically the older stands that go, and that's decay. It's erosion of these existing stands, and the longer a stand is there, the better the

chance that it has to disappear. So that's why we call it decay. It's kind of a good concept of radioactive decay, kind of a half-life. It's that sort of idea.

Roy Aserlind: Okay. One other point of clarification. You use the terms "wandering gravel bed", and "confined wandering gravel bed". What are the parameters between a confined and wandering?

Mike Merigliano: Basically, I will go back to the super system: in a meandering system, the width of the meander belt is related to the width of the channel. If you look at rivers at all different scales—skinny ones that are meandering—and you blow them up, they look like a big river. Same for the golf stream, there's something about the way water goes. But with braided reaches, it's more complicated. It's essentially meanderings and straight channels but there is sort of a pattern of width and basically braided out-width. And if that width, overall width, looked confined on the river—and we cheated, we looked at photos—and if they were constricted, we called that confined. And then after the fact, after our stratification, I looked at the confining ratio to see what the differences were between the wandering (the truly free braided reaches) and the confined reaches. And there was a fair bit of difference there.

Roy Aserlind: Okay, let me ask one more. This is strictly hypothetical. If you take a braided section of the river, could you hypothesize that say in 300 or 400 years that that braided section would be downstream?

Mike Merigliano: At Mallard's Rest—most people know where that is—that is a break between the really entrenched reach and where it becomes braided. And when you look at the percent of slope change **and ???,** there's a change there. Of course, I can't answer: Is the river cutting upstream? Is the braided reach going to migrate upstream? The entrenched reach is that going to just cut more and more and widen up? Or is it basically downcutting upstream and the braided reach is going to basically move downstream? There is a big nick point at the canyon near Carter's Bridge; the sediment there is about 40 feet deep. So it can't go too much below that; there's a big rock ledge down there. So there's some controls and whole thing about the Yellowstone, from what I can see, geologically the Yellowstone is so young, and yet we have this idea of braided rivers, you know they're all sloped by this tremendous sediment, and of course there's a lot of that in terms of the river, but it's still moving around. Your question really gets to that: What's going to happen to these braided reaches? Are they going to go upstream, or downstream? I think that it depends on sediment supply, which is probably diminishing because a lot of it is left over from the glacial debris that's moved down the channel. So it is my hypothetical answer to your hypothetical question that there is a trend toward stability and they will probably become more entrenched than braided.

Roy Aserlind: Sounds like one of your doctoral dissertations somewhere.

Bob Wiltshire: First, let me make sure I have this right. You said that on the Yellowstone you noticed greater areas of older trees then younger trees, as compared to other rivers, is that correct?

Mary Louise Polzin: Right.

Bob Wiltshire: Could you give us some guesses as to why you think you're seeing that here?

Mary Louise Polzin: This is purely my theory and I haven't investigated it, or compared it, or done any statistical analysis yet, but I have a feeling that there's a faster turnover rate very close to the river (where it moves back-and-forth quite a lot) compared with the total turnover rate (the actual moving across the flood plain). The older, established stands are a lot slower than out in the front part of the river channel, and so it keeps the older area bigger for a longer period of time. This is because it takes it a lot longer to come over to it and bring it back across. Whereas, it can go back and forth within a small distance much faster; you always have a smaller area of young trees that are getting replaced with younger trees, and you get processes much quicker and faster in those areas. It is a smaller area for that flood plain, than the area occupied by the older stands; but the older stands will eventually be turned over. Because of the episodic nature in 1996 and 1997 floods, we saw big areas that lost a huge amount of old forest, but then you go down another 100 or 200 meters and the old forest is still there. So, you can't predict how long it is going to be there. When you add it up, all the areas of all the old age stands, they covered a bigger area than when you added up all the areas of the young ones.

Bob Wiltshire: Decay curves. I noticed in Part I of the presentation, decay curves were expressed as straight lines, and in Part II the decay curve was actually a curved line. Is that significant?

Mike Merigliano: My graphs show the Y-axis in log scale, and expediential curves are straightened in the log scale. Mary Louise kept it as a regular scale, arithmetic scale, so they're more curved.

Bob Wiltshire: I don't know if there is any way to answer this but is there any way to tell if the decay curve has changed in the last 20 years, 30, 40, 50 years?

Mike Merigliano: Yeah, we can do that. If there's some backtracking of the ages were on the older photos. What's missing now, we won't be able to. If there's something on an old photo that's gone, we can't answer that. I just plotted one graph. They're all really pretty similar.
But getting back to your first question for Mary Louise: why is the decay curve maybe not straighter, what's with this hump? It's essentially that not every place gets eroded; it's not that even, and mainly because we haven't looked at the river long enough. Three hundred years is really a short time in river systems, so there's two ways to look at it: if climate isn't constant—with rain/rainfall, snowmelt, sediment that's been constant for say 5,000 years—and we look at the river for that long, they would all even out. There have been some studies on big evulsions, which braided rivers do. And it isn't just a cutting and filling, it just jumps over, and those are on the order of centuries, and so we haven't seen that. Like Nelson's Spring Creek and the spring creeks, those may be reoccupied (you know without the riprap there) on the order of centuries, where that was probably the main river, who knows when. But climate does change, and we know that during the Little Ice Age, which ended about the 1850s, it was a fairly different thing. And what I have seen—I do a lot of research all throughout the west and have been up through Canada—there seems to be a trend in floodplain dynamics: as you go further north, because there is more sediment deposition, they are more active, so what could have happened during the Little Ice Age or even before, is the river was much more active and we are seeing now these old stands, that were left over from a much more dynamic river that created lots of young stands, then slowed down, and now those things are old. And the river is just kind of wiggling around, but that's again hypothetical. But it does get at these assumptions that everything remains even. Think about that line, which we tried to fit as a reference point, something that does behave that way, and the Yellowstone may not. That's kind of where we are at here, right now.

Bob Wiltshire: One last question. You've been doing this for most of your professional career. You've been a lot of places and done this. What, if anything, surprised you about the Yellowstone system?

Mike Merigliano: Well, first off, it's not most of my professional career; it's been over 10 years, so maybe that's something. What surprised me the most, well it wasn't like I hadn't seen it before, but the amount of vegetative reproduction. The first site I went to was like "holy cow", there's at least a hundred years of each spread right here, right on the surface that looked to be the same deposit all throughout. And so right off the bat, we knew this was going to be a tough place to age and we've have to consider uneven ages in these patches. Even though the patches probably come in—all this seed on these gravel bars—but they don't stay that way, and that's what Mary Louise is trying to get at. So, I think that vegetative reproduction was the big surprise.

John Bailey: I just realized that in tonight's presentation we did not hear our eight standard questions addressed. The public may not be aware of the eight standard questions that we ask each presenter to answer for us. The Task Force was given these in advance of this meeting, but the public is unaware of them; so, I'd like to ask you, Mike, to read and answer them for us now.

Liz Galli-Noble: I did make a few copies of the questions and Mike's responses and placed them on the handout table in the back. They are also posted on the Task Force website; but I still think it is a good idea to go through them now.

John Bailey: It's part of the presentation process, and information that everyone needs.

Mike Merigliano read aloud and answered the following questions:

IN RELATIONSHIP TO THE RIPARIAN TREND STUDY….

1. **Recognizing your study's budget and time constraints, how comprehensive are your data relative to the Task Force study area of the Yellowstone River?**

   Our data was randomly sampled from willing landowners above and below Livingston. Study sites extend from Gardiner to about ½ mile above Springdale. We did not sample the reach between Carter's bridge and the railroad crossing downstream of Livingston, as this was quite urbanized and we were focusing on more natural, intact reaches. Also, the urbanized reach had many small land ownerships and gaining permission would have been very time consuming for the data gained. The broad reach between the railroad bridge and Elton was under-sampled due to access permission denials.

2. **Have you found significant differences in your results relative to different geomorphic sub-reaches of the Task Force study area of the Yellowstone River? Why? Why not?**

   We have found significant differences in vegetation patterns among sub-reaches. Patch size and total amounts were related to flood plain area per channel length, and species composition varied as well. Cottonwood age distributions also varied. Geomorphic sub-reaches had different rates of erosion and flood plain topography, and plant species respond to these factors.

3. **How important is the connectivity between the floodplain and river in the interpretation of your data?**

   The connectivity is very important, as riparian vegetation development is directly tied to channel and flood plain processes.

4. **How have the resources you studied in the Upper Yellowstone River changed over the last 50 to 300 years?**

   In most areas the *general* character of the river and its flood-plain vegetation has not changed much in the last 50 years. The spring creek reach has been stabilized longer than other braided reaches. Although the general character has not changed much, new patches have been created and old ones eroded.

5. **Are there any particular river conditions—natural or anthropogenic—that your results indicate are important stressors on the river processes that you studied?**

   We focused on quantifying the inherent, natural dynamics of the river system. Channel stabilization is a likely "stressor", in that it slows down or eliminates channel migration. Several plant species are dependent on a migrating channel. There were not enough human-caused stabilized reaches that existed long enough to test differences in dependent species, but naturally stable areas can be compared to naturally dynamic ones. (See question 2).

6. **Recognizing the short-term nature of your study, do you think that the condition of Upper Yellowstone River Watershed—for example, its vegetation cover, recent drought, altering events such as fires, timber cutting, grazing, and residential development—have influenced your research results, relative to the river processes you studied?**

   Our study was retrospective, and study areas were limited to the flood plain or near-channel area. The retrospective approach diminishes the short-term effects of drought and floods, for example. However, although the study period (1999 to 2002) is small relative to the time scale of the study itself, short term-effects still show up. For example, new gravel bars and associated vegetation were observed/quantified during our study, but were created during the 1996 and 1997 floods. Other gravel bars were created in past years, and we could observe them on old photographs as well as the more mature vegetation on them today, if they still exist. Watershed-scale factors such as fire have an influence on streamflow and sediment, but the effects are likely spread-out in time and space on the aspects that we studied. Livestock and wildlife grazing have the greatest potential influence on our results. Rigorously accounting for grazing effects would have added significant time and cost to the study. However, vegetation characteristics were noted along with grazing impact during the study period in study areas. Long-term (100 years) changes in general vegetation character were compared to the present using historic photos.

7. **What portion of your results do you see integrating with results of other Task Force studies?**

   The vegetation cover type and structure mapping, as planned, will be incorporated in the wildlife study. The fish-habitat study (USGS-WRD, Bovee & Bowen) is incorporating some basic vegetation aspects, but our results are probably more detailed than they need.

   The cottonwood age distributions and flood plain turnover rates can be related back to the geomorphology study. We also have soils samples and cross-sections of the flood plain sediments that may be useful for broad comparisons in the hydrology (sediment budget) and geomorphology study.

8. What other questions were raised by your research?

The most important questions are probably:
*What is the influence of local (on the flood plain) fire on flood-plain vegetation?
*How much vegetative reproduction is there among cottonwood stands, and how does it affect stand longevity?
*What is the relation between understory vegetation, especially shrubs, to grazing and soils?
*Why are some reaches entrenched and other braided within similar glacial outwash deposits? Glacial history seems to be related to channel pattern but the details of process are not well known, if known at all.

John Bailey: Thank you Mike.
We will now entertain questions from anyone.

Doug Ensign: You've identified cottonwood as a particularly key species to indicate health in a riparian area. My first question is: I wonder why is it that cottonwood is such a key species? And secondly, are there other species that are equally as key, and what would those be? Where I'm going with this is that there was some indication that cottonwoods are capable of regenerating through suckering—without flooding perhaps being quite as important to the regeneration of that species—would that also be true of other species that spread through channel migration?

Mike Merigliano: There are three reasons why we picked cottonwood. One is we'd have to quantify this floodplain dynamics, and cottonwood is basically a clock of the flood plain because it indicates when that land at least first stabilized. Now that was confused by this vegetative reproduction, but the seedling aspect of it works. We could have done a more broader, coarse-scale study just by looking at photos. We are going to do a little bit of that in the future. And another aspect is that cottonwood is a dominant species, it probably has the most biomass of cover out here. Just based on that, we considered it important from a wildlife standpoint. The forest canopy cover ameliorates the climate and it keeps it a little cooler; you know people need it for their cows and calving areas, and it's the same idea for wildlife. It's kind of simplistic, but it was so dominant. So, for the aging aspect, the clock aspect, and then it's so dominant, we did key in on that, and it's easy to track on photos. And again, there may be some confusion with this vegetative reproduction, the seedling aspect is important. It may, I think, be diminished with the vegetative reproduction. But that was the idea behind the future work that Mary Louise is hopefully going to do.
And then there are admittedly other species that don't depend on floods, and I think the most common one is probably the juniper. That comes in on older sites, and as they raise up with additional flood events that sand trap gets thicker, the sediment increases, and it's more of a dry site. You see that on the grasslands, but it can occur down on a cottonwood forest as well, because that surface dries down. So that's one that's essentially non-flood dependent and still quite important. There are others, such as skunkbush out there, and it's probably not flood dependent, and silver buffaloberry. I could go on; there are a lot of species that are not flood dependent.

Doug Ensign: The question was are there other species that, like cottonwood, are more <u>dependent</u> on channel migration? Can those species also regenerate themselves much as cottonwoods do, through suckering?

Mike Merigliano: Sandbar willow is much that way. It comes in with fairly few stems per area compared to cottonwood, but if the conditions are right, particularly toward the channel margin, they can come in well, as really thick stands or strips of sandbar willow that are very clonal. Sandbar willow and their related species are extremely that way. If Mary Louise had done her genetics on sandbar willows, a lot of those stands would be all connected together, and many studies have shown this by dinging them up and demonstrated that. Most people think that willows are short-lived, but they live quite a long time. I've aged willows in old channels that were cut off 80 years ago and so there hasn't really been any flooding there, and there are still healthy, vigorous sandbar willow. That would be the best example, and some of the other willows as well.

Doug Ensign: So, I guess the last part of my question was if it's capable for those species to regenerate without having to depend on flooding, does that make flooding less important to maintaining riparian vegetation along the Yellowstone?

Mike Merigliano: It depends. We're talking on century time-scales. We don't know how long these things will last. It's a risk to just say that floods can be taken away, because there are systems, lots in the west, that have

really declined rapidly. Especially in the southwest, where trees just don't live as long and water development with damming and channel stabilization has gone on for say a 100 or 150 years, and they've lost whole cottonwood systems down there. We're luckier here because trees normally grow slower, and the development takes longer, so it just takes longer for the effects to show up. Also, narrowleaf cottonwoods and some of the other cottonwoods sucker a bit more. But we have seen, or at least I've seen, situations where what looks like the older, bigger, original seedling and the suckers around them—when the so-called parent tree dies, I've often seen the suckers around it die as well. There are a lot of situations where the parent tree dies and the suckers don't die. There's every combination you can think of, and that's what we tried to take into account. So that's been our idea behind this more broad study. We want to learn what these situations are, but we're trying to get a sense of how extensive and common that is, and I am going to sample it. So we're trying to get a sense from the sampling perspective.

Mary Louise Polzin: I just want to add that if you just had vegetative reproduction, and no seedlings, you're losing the diversity that you get with the seedlings—all of the crossing of the genetics between the males and females. Once you lose that diversity, which could take up to hundreds of years, you could set up a system where some disease could come in and wipe out all of the trees because they are so genetically closely related. Where it would have only wiped out 20 percent of the trees in a diverse system. If there had been a seedling source, they wouldn't have been so genetically closely related. You do have some disadvantages when you have only vegetative reproduction and no seedling production. A few studies have been done in other systems that have shown that hybrid trees (between the different types of cottonwood) are more susceptible to things like gall mites and other infestations. So you may be setting up something like that too, if you only have vegetative reproduction and no seedling recruitment at all.

Bruce Rich: These are two real easy ones. Real old trees, I heard you suggest maybe a ten percent error margin, from 350 to 400 year old trees. On the bulk then, out there, covering most of the surface area which are 100 to 150 years old. What's the error margin there?

Mary Louise Polzin: I'm not sure what that kind of error margin is associated with just aging, the actual aging of the trees?

Mike Merigliano: I can answer that. There are different sources of error when aging trees. One is just basically, we take a core and count the rings of the sample, that's fairly straightforward, you can count them. Sometimes you can't see a ring, you have to play around, you know 150 or 152, we're pretty confidant there. So there's maybe a percent. But the big source of error in our study, what we couldn't do, is addressing that sand cap, that overbank deposit that the seedlings come in on the gravel bars. So that establishes the surface of the zero age stand, the original stalk gets buried maybe a meter down and meanwhile, as that tree has grown out to be a meter or two up, beavers are cutting down, and they sprout down, so you lose some years there, and then all that gets buried, and you have a nice looking stem that comes up. We did some digging, but basically we cored at the ground level. To give you a more precise aging job, you really should dig down, wherever it is to the root collar and core it there. When I did my study on the Snake River that's what I did, but it was a little easier there to do that. And besides, digging holes on private land, there were some landowners who didn't want to see us digging holes; and it takes a tremendous amount of time. So we compromised there, knowing that we're a little off because of coring a little bit higher. There is that source of error. Those are the two main sources of error. The big one is the buried part. It's hard to know an exact percentage, because if we had say 10 percent of the trees that we had aged, say, okay we think it's this, and we go down, dug the tree out of the ground, get back to the lab, and cut slides, and examine them and got the best age we could get. That can be, there was a study on the Missouri River where they did that, and it was depending on what tree they sampled, and they basically got from 5 to 30 years, but they have a lot more burial there too.

Bruce Rich: So the final answer is 10 percent. My second question may really show my naivety about plants, but when you do this clonal stuff, when you get your information back, will you be able to tell the difference between clones and siblings? When you get this information, and it appears like these two young critters next to each other are related because they're vegetatively related, but they're identical, they look identical, therefore they're vegetatively related. Can you tell then the potential siblings from seedling stock? I don't know much about plant genetics and how plants work that way.

Mary Louise Polzin: You're not going to be able to tell whether or not the parent actually originated from seed, or if the parent was another clone from somewhere else that's long dead. All you're going to know is that they

all have the same DNA, and so they're basically the same tree; they are clones of each other. But you don't know if the original one was a clone or not, you can only assume that the original one was from seed.

Bruce Rich: I'm not actually asking you about their parents, but about these two trees right here. Can you tell from the DNA, or are you going to be able to tell from the DNA that they are clones off of an adult somewhere, as opposed to siblings that occurred from certain seedlings? That's my question.

Mary Louise Polzin: Yes, with the DNA, we're going to know that they're clones. If the parent tree is in the plot where all the leaf samples were taken, they're going to all show up as being the same tree. If you've got ones that are aged 20 years old, and the same tree genetically is 100 years old, there's a good chance that the 100-year-old tree that's the same as the 20-year-old trees is the parent tree. But you're not going to be able to tell genetically that it's the parent tree, because they are all going to have the same DNA fingerprint.

Duncan Patten: Mary Louise, in answer to Bruce Rich's question: the seedlings will show up with different DNA, so they can be distinguished from one another (assuming that enough DNA has been collected). They will be able to distinguish seedlings from suckers. If they have a lot of plants that are all the same DNA, they could be suckers; and if they have another one, maybe one or two individuals that are totally different, those could be seedlings.

Mary Louise Polzin: Right, if they were all occurring within 100 square meters, the ones that are different are probably seedlings.

Bruce Rich: That does get at my question more directly but I'm actually kind of thinking that maybe you won't find the ideal thing in every tree in a 10 x 10 quad. I don't know plant genetics, but what I wanted to clarify, and I think I heard it from Duncan, is that if you find a clump of three or four trees, are you going to be able to clearly state that yeah, they're clones of the same thing? Or that they're same age, or roughly same age seedlings?

Duncan Patten: You're describing cottonwoods as looking the same, Mary Louise is doing DNA, that's the difference.

Bill Moser: Looking at your skewed distributions you were pointing out. A couple of weeks back these guys were talking about there isn't that much difference on the Yellowstone between the two-year floods and 100-year floods in terms of volume, etc. of water. How long does one of these saplings have to be under water—a week, 24 hours, or whatever—before you bypass that whole generation and then you end up with this skewed distribution?

Mary Louise Polzin: Well, for how long will little tiny seedlings or juvenile poles, shrub tree type things, or just the actual first year seedling?

Bill Moser: That's the point. Once you get to a certain height, it doesn't matter what the water is doing around them, but you could wipe out, every four years you could wipe out, for 25 years straight, and then all of a sudden you've got 30-year-old trees and nothing. When you look at that 75 years later, you would say wait a minute, we've got a 20-year period here with nothing. Is there a point where it drowns, the little ones?

Mary Louise Polzin: Well the first year seedlings can't take standing water for extended periods of times. I think it's three to four weeks, and they probably aren't going to make it. But if you've got higher trees, ten years old or so, they can be under water for a month without it killing them. But if that water is moving and scouring, it may not be just because they're under water for a few weeks, it's the movement of the river actually digging them up and removing them that is killing them.

Bill Moser: So, what do you attribute your uneven ages to?

Mary Louise Polzin: The uneven, whereas not having as large an area with the young ones, compared to the old?

Bill Moser: You said in a given area you would expect on this sandbar, all these critters to be uniform in age, and they're not.

Mary Louise Polzin: Not when they're older. When cottonwoods are younger, they are uniform. But once they've matured and have risen above the channel elevation (this gradual increase in elevation with the depositions) that's when you start getting the uneven patches. And of course we don't have the DNA analysis, but we're assuming that if you have an area where the trees are all 20, 21, 22 years old, they're probably all seedling recruitment. And they'll of course thin out as they get older, and then possibly that is when the clonal recruitment is starting to take over, and making the unevenness. I've got one plot (my best plot) that has the tightest age group—where almost all of the trees are 36 years old, and there's the odd tree that's 37 and one that's 35, but the plot is almost totally even aged—and I'm assuming that's all seeding recruitment. If we do DNA analysis, and it shows us that it's actually suckering, well then I'll have to rethink this; but we're assuming at this point that these young stands are seedling recruitment. It's not until you get to the older stands that are at a higher elevation that you've got the root suckering and unevenness of ages occurring; you can't get seedling recruitment at that kind of elevation.

Brad Shepard: So your hypothesis is that the uneven-aged stands aren't undergoing any periodic flooding and the reseeding?

Mary Louise Polzin: Well, they are undergoing periodic flooding, but seedling recruitment doesn't occur under the canopy of a mature forest; it doesn't occur in a heavily vegetated (heavily grassed) or any kind of vegetation. Seedlings also are not going to survive—they may establish and they may survive for a month or two before they die. They are not going to occur two meters above their ideal elevation for recruitment, because seedlings have to grow their roots fast enough to keep up with the declining floodwaters (to keep in contact with that moisture), and if they're two meters above that water, they're going to be high and dry, and dry out. So, even though the area is flooded and can get deposition of fine silts and things, the seedlings that will come in on there will only live for a couple of months.

Dennis Flath: Do you feel ice scouring plays a role in cottonwood dynamics on the Yellowstone?

Mike Merigliano: There are some local places where I saw ice scars on trees and some pushing around of gravel, but channel dimensions and just the general amount of scarring on vegetation is fairly limited on the Yellowstone. I have worked on other studies where ice is a major factor in a channel, shape is different, you can just see, especially on bends and outside bends, there's just big huge scars that are well up above the normal river flows from the ice just kind of rafting upwards and chewing all those trees out. But I just didn't see too much of that along the Yellowstone. So that's why we didn't do much with ice drives, because there just wasn't much to do there.

Steve Caldwell: How much do you feel your calculations of the decay rates were affected by the simplifying assumption on the 91- to 100-year-age classes?

Mary Louise Polzin: On the wandering gravel bed systems, it was affected, but I think it wasn't a large effect. I am going to go back and take out all those, and see how much of a difference there is. For the area that I did assign this arbitrary 100, and there weren't that many areas like that, I don't feel that it affected it very much. But for the confined wandering gravel bed, it had a huge impact and it's not going to work at all; that has to be redone—either taken out, or something else done. But on the wandering gravel bed, we are going to take it out to see what difference it does make with it. I don't expect it to correct the big hump that you see in our figure, but we're definitely going to look at that to see if it makes a difference.

Scott Bosse: Are there examples of some large, undammed river reaches throughout the west that have lost cottonwood forests, or lost their capacity to regenerate? And if so, if you can cite some examples, and what were the reasons why cottonwood regeneration stopped or the forest actually shrunk in undammed river reaches, fairly similar to the Yellowstone?

Mike Merigliano: They're hard to find, undammed cottonwood systems in the west; but there are some. I think there's a big braided reach on the Clark Fork, just below Drummond, no actually, I guess it would be just below Rock Creek where it comes in from Anaconda, and I've done some work there. And that was really striking to me, because there is a lot of channel migration that was really obvious. There's a lot of new deposits, but hardly any woody vegetation. My impression, although I wasn't there a long time but I go there every once in awhile, is that there's a lot of winter grazing from elk and deer, and lots of cows there. So it has constant pressure from ungulates and my impression is they just never got a chance to establish.

Scott Bosse: I'm just curious, on a river like the Yellowstone in Park County, what variables in an undammed system do you think would have the most impact on cottonwood regeneration? Would it be bank stabilization, noxious weeds, grazing, what would you see as the most important factors here?

Mike Merigliano: I would say channel stabilization, because it limits the channel migration, and unless the river makes up for the trees that got established with the suckering—you know they are basically uneven aged, self-perpetuating kind of climax cottonwood forest, which is unusual, but possible. And also some sort of bank erosion, I think would be it. Again, we did not do a grazing study, but I wandered around a lot and there's kind of a grade out there; you know something that is really quite heavily grazed and something that was not used that much. But ignoring the real heavily grazed—which is essentially like a lawn and does not have much woody vegetation, and you see that it's really limiting the stuff that's three feet tall or down—there wasn't a lot of difference in shrub species, understory species. Even places in the confined reaches where the cattle were down on bars, I didn't see a lot of use on top of it. Some of the places where I did see quite a few cows—around summer, and I didn't really see much cattle in the summer on the Yellowstone down on the river, they're kind of up on the next flat up where they irrigate pasture, but down on the river I did see somebody's cows—and there's not much use on narrowleaf. And I've seen that on other systems too. I don't know if it's just they don't like the way they taste, because they sure eat the plains cottonwood, they seem a little more palatable. But again, we didn't study grazing. It's kind of a hidden aspect, but I did work along the river and I tried to pay attention to that, but my impression is that the cattle, unless they're really hammering it, are not a major impact.

Mary Louise Polzin: A secondary one after bank stabilization—and I don't know where you would rank it—but I saw, in certain areas, a lot of destruction through beavers. Which may indicate that the actual beaver population isn't in balance with the system anymore; I don't know, I'm not a wildlife biologist, but there was in some places a lot of beaver activity taking down humongous trees. Rachel [data collection team member] and I had this joke that it was where the beavers came for the Olympics because of the size of the trees they were taking. I see that that could have an impact, especially on an area that has been stabilized and you're not getting a turnover with the seedlings. Who knows what kind of impact an unbalanced beaver population might have?

Andy Dana: Can I just respond to this, a direct response, I just wanted to clarify: you did say earlier, though, that you did not find any data showing that bank stabilization is limiting cottonwood reproduction. I think that's what you said.

John Bailey: They said in the spring creek area they did not see that bank stabilization had changed the cottonwood stands; you said that right?

Mike Merigliano: Oh, I think what I was getting at is the way our sample units are designed, they are quite large. So, one or two of them basically captures the leveed/riprapped reaches in the spring creek area. So, from a replication standpoint, it doesn't show much comparison, one reach versus all the others. But we can look at those reaches and see what the age distribution is. Some of those levees were put-in in the 1960s, when they built the road; so that's quite a few years. And the other better example is actually the highway and the railroad. The railroad was put-in in like 1905 or 1880's, quite a few years ago. But the 1918 flood did breach that; it just went right through it. I think that when they finally built the highway, that blocked that section off. That's on the west side of the river, as you're driving out the valley, it's to the right, on DePuy's, the highway is cut off. That's another section that's had 40 some odd years of basically leveed, cut off channel. And you can see that there are some old stands in there, and they're just getting older. What would it have been like, without the river or gravel road and lots of riprap; had it been reclaimed, and had young stands in there? There may be the effect that we can see in that braided reach of the riprap, of an effect from the riprap.

Andy Dana: But your data hasn't shown that.

Mike Merigliano: We haven't looked at it yet. And if we do, it'll be a sample size of one, essentially for the riprap versus the other reaches, which essentially have not been riprapped for very long. When we started to design this cottonwood study, the one approach was an experimental approach that looks at reaches that are riprapped and others that are not. I kind of shied away from that, mainly because there just, the river has not been riprapped that long in regard to a system that is kind of slow. And, the limit in the space, and limit in time aspect of the riprap; I didn't think it would be very fruitful to kind of an experimental approach that way.

Scott Bosse: That's why I asked that question. Do you know of any other river systems where stabilization has been in place for a long time? So you can have a data set and observe change in the vegetation.

Mike Merigliano: The Snake River in Jackson is a really good example, that's close to the Yellowstone. I mean there are many similarities: the river morphology, it's got a braided reach, and cottonwoods and a lot of these same species. I think if you turn back the clock to say 1952, that's where we are now here on the Yellowstone River. There were lots of private projects put in on the Snake, and then Teton County Wyoming asked the Corps to come in and finish the job, and there's now basically a continuous well-constructed levees along the Snake. So you can picture a really wide, I mean half-a-mile to a-mile wide, cottonwood, braided forests. Now, there's just basically a sinuous channel system bounded by riprap. So, everything within that riprap is moving quite rapidly. They get seedling and saplings establishment and then, bang, they're gone. And then everything outside the riprap is basically stable and growing older. So, I think that's the best example that ties to the Yellowstone, from this bank stabilization aspect. Does that answer your question?

Andy Dana: It does, but you don't have any data to prove it on the Yellowstone, to show it on the Yellowstone.

Mike Merigliano: Well the only way to do it on the Yellowstone is to wait 50 years and track it.

Tom Pick: That's really interesting information for people that are fascinated by how things work, but why your study focused on the relationship of the river to the riparian vegetation, I guess basically I'd like to know, will we be able to deduce from your information how the relationship of healthy functioning riparian vegetation to that turnover rate? That is, how important is riparian vegetation on the Yellowstone to modifying the natural cycling of that turnover rate, versus not having it?

Mike Merigliano: What are the influences of vegetation on channel migration? I imagine it would slow it down. We couldn't study that here because it's all vegetated. There are places in the world that have unvegetated braided reaches, but they are farther north, different processes there, below glaciers, but they did move faster. It's a tough one to do because we have conditions and climate that are different. There isn't any treeless, unvegetated, braided rivers that has a similar climate now that we have here.

4. <u>General Discussion Session</u>

John Bailey: I'd like to end the question-and-answer session and move into the general discussion session. I think some of the questions have been more in the general discussion area on this, but I think that shows that in their data they found some things that they weren't expecting to find when they started. I think that's what a lot of research studies do. I certainly appreciate what you've done, and look forward to what more you find, and hope that you find it before we're done. So thank you very much.

Now we're going to move into a general discussion session, and first up is the Task Force.
All right, I'll start. I wrote one comment down and we've somewhat covered the topic when we talked about the suckers, but I still want to ask it and it may be something that I think that the TAC may have to look at it; it's a concern. At the last meeting, Chuck brought up that most of the two- to ten-year floods, which are the normal floods, don't change the river, but the 100-year floods were the ones where things were changed. I'm wondering if part of this turnover problem that you're having is due to the fact that when things change here, it only happens (if Chuck is correct) in these100-year flood events. Which would help explain why we have these old stands. I think we need to bring these two things together, and that's why I didn't want to ask it earlier in the meeting, because I don't think it is a question just for the riparian vegetation study. I think we have to be bringing various studies together.

Duncan Patten: I think Mary Louise answered that in pointing out that they are not finding regular patterns, they're finding these episodic events that are causing these changes. It isn't just every two years it changes, it changes, it changes. It's nothing happens and then bingo, something happens and you get a stand, and then you don't have a stand for a little while longer, and then you get another change. So I think those do fit together because the river does work in pulses and episodes, it doesn't work on a regular, grinding away pattern. I think your tree age data supports that.

Tape malfunctioned and it did not record several comments here.

Mike Merigliano: Yeah, another way to think…

Laurence Siroky: I would think you'd have other…

Duncan Patten: This is your presentation but…

Mike Merigliano: Yeah, but as far as other factors…

Laurence Siroky: They'd eat the younger ones…

Mike Merigliano: If the seedlings are old enough…

Laurence Siroky: My point was, there are other factors…
Laurence Siroky asked about other factors that could effect the age distribution besides floods, such as insects and drought. My reply in essence was that these other factors would be relatively minor, and they would affect the age distribution via mortality, not regeneration. If seedlings were old enough (when browsed on or defoliated), they would sprout back.

Duncan Patten: There are some papers…drought…

Mike Merigliano: And the flood plain doesn't…

John Bailey: Are there other comments?

End of Tape 1

Begin Tape 2

Brant Oswald: I guess I would hate to see the ability of cottonwood to reproduce asexually as being a justification for bank stabilization. And I think one of the most interesting parts of the whole discussion has been some of this information on the clonal reproduction, so I'm certainly really interested in this. One of the things that has come from this discussion is that there is a larger instance of that kind of reproduction than you see in other cottonwood forests, and other river systems? Is that accurate?

Mike Merigliano: No, I've seen a fair amount of suckering on other systems, with narrowleaf cottonwood, but then there are other systems where it is very scarce, and I don't really know why. On a broad scale, on some systems it's scare and others where it's common.

Mary Louise Polzin: And there are some systems like the black cottonwoods on the plains that have a lot of sucking too. But this hasn't ever been quantified, for the amount; everybody notes that vegetative reproduction is there, but there are very few studies saying how much of this is occurring in all these different systems. I think a lot of it is this lack of information that we can base anything on. Everything is assumption and guesses and maybe this is happening but we don't know. And so you can't guess as to what's driving it, and what's the effect on everything else until you get some information on how much is it really out there.

Duncan Patten: Mary Louise, do you plan on looking at the annual peaks and the hydrology relative to what you think may be years of suckering? If you see certain peaks, does it also imply a continued connection between the river and the flood plain?

Mary Louise Polzin: Right, that's correct. There are overbank flows but they're not so high as to scour and remove mature trees. It's over the bank right in the area and that may be a force that's initiating this root suckering. So, if we identify through DNA that these are suckers and there are so many trees that are 20 years old, but the flow, where would that have gone on this site? Is it an overbank situation? Because we'll have the elevations for those sites of the DNA collections as well. So, hopefully there will be a correlation established.

John Bailey: I don't think this DNA work is really part of our Task Force study.

Mary Louise Polzin: No, it's not part of this study.

John Bailey: Is this going to be available before we're done?

Mary Louise Polzin: No.

John Bailey: Okay, thank you. So, for our deliberations, the answer will not be available. I hope everyone here understands that there is an issue here that we as a Task Force, in our deliberations, will never have the data to address. We'll be long gone before that data is available, so I want everyone to be clear about that. We have to also look at this in any kind of recommendation we want tied to the study. I think some people would want to address that, because some people may think we're going to have that before we're done. I didn't think you would.

Andy Dana: Just a general question about what your impressions are about recruitment on this river, basically, compared to other rivers or on cottonwood regeneration and others, is it relatively high? Is it relatively healthy?

Mike Merigliano: Yeah, it's a big, free-flowing river and it's been moving around. There are some reaches on the Salmon River that are comparable. And that's what I was trying to get at what occurs. But there's just been so few studies that have really looked at a whole cottonwood systems, it's been hard to get at it. But my general impression is that it's still, in most reaches, it is what I would expect.

Bob Wiltshire: Mike, can I follow that? You are looking at pretty much a historical basis, and so we've had a large increase in bank stabilization in a fairly recent period of time. So, you are not at this point in time measuring the effects of that recent stabilization, is that correct?

Mike Merigliano: Yeah, that's what I was trying to get at before, when I spoke about earlier meetings when we were planning the study, it seemed to be an experimental approach, looking at a reach that we could study more readily. It just hasn't been that long a time, 40 years or so, is still a short time in the scheme of things.

Bob Wiltshire: So, what you're showing us, and the recruiting is showing us, and the decay curve we're seeing, is basically based on the river as it was prior to 1996/97/98/99.

Mike Merigliano: That's our general assumption because a lot of the stuff went in right after the floods. And that would be our deal with inherent, more or less, natural rate, and then building maybe some scenarios with more riprap, less cottonwoods.

Audience member: You spoke about the south fork of the Snake, what reach was that in?

Mike Merigliano: In the Swan Valley.

Audience member: Was that below the dam?

Mike Merigliano: Yes, and that was just a natural curve.

John Bailey: Other issues?

Andy Dana: That's below a dam isn't it?

Mike Merigliano: Yeah, but the way I did the curve was to include only stands that originated before the dam.

Joel Tohtz: I wanted to get an answer to Andy's question. Is more cottonwood behaving in a healthy way or whatever? You said in most reaches it's behaving the way you would expect with your qualifications. Does that mean for somewhere it wasn't?

Mike Merigliano: Well, mainly the places that are rocked (are riprapped), behind the highway, that are separated from the river.

John Tohtz: What I'm really getting at is, what made the places where it is separated that are expected to decay; what made those different from the rest of the river? Is it, these types of things that maybe you're talking about, in reference to the decay?

Mike Merigliano: From a physical standpoint, what made these places different was extensive, relatively long-term (since the mid-1960's) bank stabilization that prevented floodplain erosion and deposition. From a biological standpoint, high livestock use may be limiting shrub regeneration in some areas, but we did not study grazing specifically, so it I tough to address.

Joel Tohtz: So bank stabilization you mentioned is possibly first on your list of activities that might limit normal processes of cottonwoods?

Mike Merigliano: And I guess added to that some bank modification may not limit overbank flooding, so deposition still occurs during floods on existing floodplain surfaces ("sand trapping"). Other places with bank modification that limits overbank flooding *and* channel migration (via bank erosion and deposition) really impacts processes important to riparian vegetation.

Joel Tohtz: And in addition to beavers?

Mary Louise Polzin: Well, I don't know where that goes. I saw enough of it that I thought it should be noted. In some areas it's noticeable, in other areas we don't hardly see any activity at all, but in some areas cottonwoods were really being pounded by them.

Mike Merigliano: On the South Fork I heard some people say: If it weren't for beavers, we'd have cottonwoods everywhere. So I did a study and aged trees and I saw places that were fairly noticeable with lots of stumps, and people would say they had been really hit by beavers. It came out to five percent. So, it can seem like there's a lot, and there's a little; but it seemed a lot less than what's people's impressions were.

Joel Tohtz: Would total grazing pressure be greater than beavers?

Mike Merigliano: No, not at that time of the year.

Scott Bosse: I'm curious where does the sand that's deposited that the cottonwoods regenerate on, where does that come from? For instance, in Paradise Valley, is most of the sediment coming from Paradise Valley, or is it coming from upriver in the Park?

Mike Merigliano: That's more a question for Chuck Dalby and the geomorphology team.

Duncan Patten: You should have been here last session, you'd have learned that.

John Bailey: Any other comments, concerns?

Chuck Dalby: I just want to make one quick comment. I think the point that Bob Wiltshire made regarding using this retrospective approach, whether we're looking at geomorphic effects of stabilization or trying to estimate what the effects of bank stabilization on a riparian forest would be, the fact that much of that action was driven by the 1996 and 1997 floods, there have been some additional revetments, levees that have been built out there, and you really don't have the basis to say what the effect of those will be. It's a very short time period. But if you look at the exponential decay curves that Mike and Mary Louise have put together, and think back to the presentation that we gave a month ago, one thing that I think you probably could do is make the assumption that—in these wandering gravel bed reaches, which have wide expanses and lots of areas of different trees—the more that you constrain and confine them, the more that you'll eventually convert the river to a single thread, plain bed, very stable channel, with a very narrow riparian fringe. We don't know how long that process of transition would take place, but I think it is one endpoint that you can define based on this analysis. So we're not completely without a means to predict effects.

Bill Moser: I assume this study is over, financially or whatever.

John Bailey: Excuse me. Is that correct? Are you done with what you're doing under our contract?

Mike Merigliano: We're done in the field, but we're still tying up the analysis, so we're not completely done.

John Bailey: You have to get your graphs in order, right? We're not done then, I don't consider them done.

Bill Moser: Okay, but as far as going out and gathering data, I'm really disappointed, there were trees when they put in Buttrey's that they took out, that were close to the size of that projection screen. There's still, you can trace the old riverbed on the northwest side of the railroad spur that might increase the size of that thing on the wall. It would be really interesting to plot where this has happened in Livingston, rather than just ignore Livingston as an area that we can't look at that, because there is a lot to be learned from the fact that this river was once northwest of where the railroad spur is now.

John Bailey: All right. I think of our other studies have come in and not looked through Livingston, and my own view is, that the biggest problems exist right through Livingston, so I somewhat understand what you are saying. When USGS was here, they didn't do the cross sections through Livingston, so we used the ones they did as examples. I think that some of that modeling through Livingston is as crucial as any other part of the river. Because the biggest dike was built through Livingston with public money because we built all the schools in the flood plain. It seems to me that the biggest problems, where the biggest catastrophes could be for the most people—not that some landowners have great problems as well, I don't deny that—is right here in Livingston. Huge values, and that's how they justified putting the dike in in seven days. Blank check, as far as I could tell, when that went in. Anyway, are there any other concerns here tonight?

George Jordan: I have a couple things: one is toward the beginning of the study and one is a curiosity on cottonwood biology. Based on your decay data and cottonwood regeneration information, do you foresee any ability to go to certain reaches of the river and bring in the geomorphic type stuff and have some predictive ability on these areas of critical importance to cottonwood development; if that is a goal of management, versus the present ratio, it's just not going to happen in this reach. So, is there any ability to start looking at the big picture management that within these reaches maybe certain forms of riprap really would have little to no effect on cottonwood regeneration, versus these areas where it really will have a huge impact, if you do that. Is there going to be a predictive ability?

Mike Merigliano: Yeah, I think I know what you're getting at. I think that I would sort of frame it as recommendations. The confined and entrenched reaches are naturally very stable in terms of channel migration (shifting), and there is limited flood plain in most areas along these reach types. Also, the channel boundaries along these reaches are not as erodible as the flood plain in the braided reaches. So landowners along the entrenched, confined reaches would have less need to stabilize the banks, because of the inherent stability. In the braided reaches, the type and amount of bank stabilization is important to floodplain and cottonwood dynamics, but also project location in context to floodplain features (such as side channels, existing channel curves, etc.). For example, a short section of riprap strategically placed can prevent future avulsions into side-channel systems, which would become much more active after being reclaimed by the main channel.

George Jordan: And the second part is, on grazing. Is there enough understanding of your cottonwood ecology that you can limit grazing for these months or for this amount of time if the landowner wants to establish cottonwoods?

Mike Merigliano: Yeah, in systems where it is obviously limiting reproduction, and I'm not convinced it is the case on the Yellowstone at least in general, there is lots of information to help landowners manage for riparian vegetation.

George Jordan: And that's been published?

Mike Merigliano: Yeah, there's been a lot on that, especially with willows.

Duncan Patten: I'd like to maybe wrap up now, and make a general statement. Part of research is, as you collect data, often you don't fully understand your data until you look in the literature. You look at what other people have learned about similar systems, similar processes and that elsewhere. It helps you understand what you're finding. So often, if maybe there's partial data or partial understanding of the data on the Yellowstone, then you go to the Snake River or you go to something else. Mike is shown some of these other curves and that from other rivers. So, it's the interaction of what we already know from other places, interacting

with data we are learning here, that really helps us understand this system. And that's part of research; it isn't: I studied this and if I didn't learn it here, I'm not going to understand it. If I learned enough, maybe something that I can learn from somewhere else is going to help me understand this. Just because the exact data aren't being produced on something in particular on the Yellowstone, some of the data that may be helpful to explain the whole literature of the other studies, that will help guide us to understand what's going on on the Yellowstone. So that's part of research, is using what we already know and applying new data, and I just want to point that out because the feeling I'm hearing here is: you didn't do it here, therefore you don't know. Well, I don't agree with that. We may not have done it totally here, but there's a lot of data out there that will help us understand what we are learning here.

Liz Galli-Noble: I just have a quick question. I know people have asked this a couple times with different words, but rather than saying "healthy", you keep saying this is "typical". My question is: is this river functioning? Are there areas that you saw where it is not functioning with regard to vegetation reproduction? And actually I'd like to ask the exact same question of Chuck on geomorphology study.

Mike Merigliano: I always have trouble with this whole idea of "healthy" ecosystems. So I try to avoid that.

Liz Galli-Noble: I don't want to use "health"; I want to use "function".

Mike Merigliano: And "functioning" is the same. In a sense, the wandering gravel bed river whether it has riprap or concrete, but it's still functioning, it would function like a confined river, but it would be different. What I am getting at here is that many human-altered stream systems have natural analogues. For example, a braided stream converted to a confined stable-bank single-thread channel would function similarly to a natural channel locked in bedrock or other resistant material. Many, myself included, use natural systems as a reference to compare human-impacted systems. But even natural systems change, and these changes are not well understood in detail because data is lacking.
Regarding vegetation reproduction, we focused on cottonwood, and it appears to be regenerating as expected in most reaches. Height growth of seedlings is slower than I expected, but not alarmingly so.

Liz Galli-Noble: How about if I ask you specifically is it in dynamic equilibrium? And, I'm talking generally, over the basic 100 miles that we're studying. Do you think that the river over the 100 miles is in equilibrium? Or is there any part of it that you see that is not in equilibrium? Like, I'll give you an example: in the Livingston reach the channel is artificially confined.

Duncan Patten: Liz, natural systems are not in equilibrium. They're in disequilibrium.

Liz Galli-Noble: Well, they're dynamic, they're changing, but in general that system can still be in equilibrium.

Duncan Patten: The term " dynamic equilibrium" got thrown out a while ago. I mean, it's not a term that we use to describe natural systems.

John Bailey: Liz, may I ask a question of you please? Isn't that question one that should be going to the TAC, not to a specific researcher?

Duncan Patten: Then I'll correct her then.

John Bailey: Excuse me, I want to stop for a minute. The Task Force Chair is very confused—very confused. The rules that we've set down to follow, we have not followed for some meetings now. When we end the formal presentation and questions session, we've said that the researchers can leave. I don't see us doing that. During the last two Task Force meetings, more questions have been asked after we go into the general discussion session (where we're supposed to have an open discussion, and issues, comments and concerns are raised) than were asked during the questions session. All the questions I hear are legitimate, and I've allowed them, but I am not hearing any discussion around here that's going to move us to conclusions and recommendations. I'm very concerned, I don't know what you want, but you need to tell me, because I don't think we're following our rules.

Andy Dana: I think you should get a gavel, and make us follow the rules.

John Bailey: I'm asking a question of the Task Force. I'm sorry. I mean, we have rules and the Task Force is not following the rules. You state that you don't want to ask any more questions, and so we move into the discussion, and then everybody asks questions. In the early meetings, we were having very good discussions and we were following the process. I'm not hearing much discussion now. It may be because we've moved into some other data and we just don't understand; I don't know. But as the Chair, you gave me these rules that we're supposed to follow and I'm very concerned because we're not close to them. So, please tell me what you want to do.

Robert Ray: Well, I would hate to see some of these questions be cut out, because some of the questions I think were coming out later, as we start to talk about where potentially the recommendations could go. I've heard a couple of questions that came out by the audience and around this table and we're going toward some closure.

John Bailey: I don't argue, I haven't cut it off. But I am not hearing the general discussion at all. Where we start having the discussion amongst ourselves—actually the researchers do not need to be present. Where we can be way off base, but things may have to be then sent back to the TAC/researchers to be sorted out. But the last few meetings have not had this discussion. There have been a few questions in our general discussions, but my assumption is that we should stay in the questions part for the whole meeting for the night, and we have no general discussion. I mean that's what they seem like to me. I bring it up because I'm concerned, because I expect one of you to come up and really discipline me for not following the rules. Except all of you are asking questions, so I'm not sure that you can. Anyway, I am concerned. We went through a lot of time developing our presentation process, and we were very adamant that there should be a separation. If that's gone, I don't know what to do.

Andy Dana: My suggestion is, do what we did in the first meetings, and that was you run the meeting more strictly and say this is what we are doing, read the rules as we go into each session, and remind the Task Force members what we are doing.

Duncan Patten: Yeah, but Andy, while I'm not part of the Task Force, but somebody starts making a comment that we want to do this, and then somebody asks a question about it. If you don't have the information, isn't it sort of nice to get that information?

Andy Dana: There's no problem in getting information later on. There's no problem in following up with the researcher, but we set out a procedure so that we could move the process along, and that procedure is designed to stimulate conversation and interaction among the Task Force members, and that's not happening (so I hear John saying) because we're relying on asking question after question.

John Bailey: Do you think it's happened?

Andy Dana: No.

John Bailey: No, I don't either. I mean do other Task Force members have a concern with this?

Doug Ensign: I think that questions are good at any time, but I think conversation and interaction is happening, but it's not happening here. Well it gives us time to think, and time to go talk these things over with other people, and perhaps more discussion will take place when we feel comfortable making a recommendation. But I think it is happening, but maybe not exactly the way we spelled it out ahead of time.

John Bailey: We're supposed to be writing down our concerns, and I don't know if we've heard too many concerns tonight, so when we have our meetings to go over all the things we wrote down, I have this feeling tonight, and I think they're a lot of concerns because the questions are coming from people not understanding or the fact that they didn't come out with clear answers, they haven't got the answers to some of it that they were expecting. Which is fine, I'm actually very happy to hear the results that you found and that you don't know, because that helps us understand the limits of how we can use the data. But I'm very concerned that, if we're going to get moved through and have a discussion that really brings it together; and I think at the same time, we have a chance to be sending stuff to the TAC, our concerns, and then they can probably bring these studies together and address our concerns. So, I'm concerned. But if you're not concerned, we can go on like this, but I'm very concerned.

Laurence Siroky: John, I guess I see this study as kind of part of the whole, and it will be difficult to come up with recommendations until we see somewhat of a whole.

Bob Wiltshire: That's basically what I was going to say as well John. What I'm hearing is: we can do this and that, and it may or may not affect changes in recruitment of tree populations. But we've also heard that we're going to hear from the wildlife people. We're going to find out, from a wildlife perspective, how important is it whether we have these trees or not. So, I don't want to sit here and spout off a bunch of stuff and then I turn around and find out it's all based on false assumptions.

Andy Dana: Bob, the point is to raise issues now, so that we have them on record, so that we can go back when we have all the other data and evaluate those issues, and now we know something different, and that was a concern at the time. The point of the process is to get things on the table, and to get people, us, thinking back and forth about it. What's going through your mind now, with that presentation? I think that was the basis of the process that we came up with.

Bob Wiltshire: Then I would suggest that at some point we ask the researchers to leave.

John Bailey: Well, at first they did leave, and since then they've stayed and then all they do is answer questions.

Bob Wiltshire: If they are not here, then that forces us to not turn back to them.

John Bailey: But they're the public too, so if they want to listen to us, they can certainly interact. It's an open meeting society in Montana.

Laurence Siroky: I guess my concept is that as you hear the parts, it's going to come together, and as the parts begin to come together then the discussion will pull together depending on our background and our knowledge individually is testing us.

John Bailey: I don't argue.

Laurence Siroky: The other thing is, the previous two reports were incomplete, we didn't hear, we didn't see the 100-year floodplain delineation, we didn't hear the final results.

John Bailey: Laurence, there has yet to be a complete study.

Laurence Siroky: That may be some of the problem, we're not getting the whole story, we are not getting results.

John Bailey: I'm not arguing. This Task Force agreed on a system/process, and said do it that way; we're not following it. I don't know as your Chair what to do. I'm concerned, and I want to bring it up, and I don't think I'm hearing an answer here.

Brant Oswald: My input, I think in that original discussion, I remember confusing the Task Force a great deal when Andy and I were discussing how this process would happen. And I was confused at the time because Andy was discussing the fact that we were supposed to have that general discussion and come away from each meeting with some tentative recommendations, or at least be able to raise some issues. And the problem I had with that at the time was I think some of the most useful part of tonight's meeting was exactly the part that John is objecting to. We went through the first round of questions, and then there was some sort of general discussion, and then that second round of questions, I think, was where I really learned the most. I guess I would be a little worried, if we're trying to expedite this process, and get views on the table quicker than we are ready for. If we have a general discussion without that feedback from the researchers, and then we have to send that to the TAC and wait for the TAC to get back to us, I'm not sure that we've really expedited anything in terms of getting the issues on the table.

John Bailey: I can agree with everything you said. I don't have a problem with that. It's not our rules.

Duncan Patten: Well change the rules, make them flexible.

John Bailey: I want this on the floor because, as the Chair, I expect to be criticized about it. I'm sorry, we're not following the rules you said we have to follow. If you want to change them, I'm in. I want this out because I expect to be criticized. Help.

Roy Aserlind: Well, we are not the same committee we were when we made those rules. We have learned a great deal. I think we've matured in our thinking. Perhaps we're more polarized in our thinking.

John Bailey: Do you want to change the rules?

Roy Aserlind: I would be willing to.

John Bailey: I don't know how to conduct the meeting, so I'm asking you for guidance.

Andy Dana: I, for one, don't want to change the rules because I want to hear what Roy has to say after this meeting. I want to hear what Brant has to say, just off the cuff, because that will help me in my overall assessment of what we need to do, thinking about the next presentation and the next one after that. That's why I like this system that we have developed.

Roy Aserlind: Well, okay, if it works. This is a horrible suggestion but somebody I think in these discussions has to make a motion. Have somebody make a motion and then a discussion, we will discuss that motion. And if that doesn't come off, make another one.

Andy Dana: I don't have anything to move, because I like the rules.

Roy Aserlind: Well, that would stimulate discussion.

Bob Wiltshire: Maybe what we need to think about doing John, is at some point we end the questions session and you do what you've done a number of times as Chair, and point at us one at a time, and we're in the hot seat to say something about what we thought on what we just heard. And we go around and do that, and if more questions to the researchers grow out of that, then they do. But it makes us all say something.

John Bailey: I just want it on the table that it was very adamant that we should follow the rules and I just don't think we are, and I'm concerned as the Chair. I think every question asked tonight was legitimate and important, but we seem to ask more questions once the presenters sit down than when they're standing up. And maybe we shouldn't allow them to stand up, I don't know, but there is something going on, there's a dynamic going on that's different. I don't think it's bad, but it's not what we set out to do. I don't know how to proceed.

Bill Moser: The Governor said that you were looking for public input, and you can always call these presenters back up tomorrow and say hey, we talked this over this afternoon and we want to know this answer. But the public is pretty well cut out of that, unless there's questions asked, and it takes a while to process what they're saying. It may be two hours before the right question comes up that elucidates some policy down the road.

John Bailey: I don't disagree with you. But I think, my sense is that we've gotten into some things where it's new to people, and the process does take longer, but it's not the rules we voted on, that we have in front of us, that I'm supposed to run the meeting by.

Joel Tohtz: Well, I was going to make a comment, but you just answered it. What I'm finding is, these studies are not unrelated, and the more we see, the more stuff I'm writing down here, and the more I am thinking about, and it's taking me a lot longer to get questions I want to ask. So, what I am getting at is that we need to revisit some of this and maybe allow some time to process these questions, so that we can ask our people here. But having said that, I do really value the comments and discussion also, so I wouldn't want to see that eliminated, but maybe questions then discussion, questions then discussion versus now just questions or discussion.

John Bailey: Do you want to stay until midnight? I'm asking a question, and I've tried to at least make the meetings move.

Jerry O'Hair: Well, I guess I'm a little bit lost in what you're expecting. I'd like to ask, how would you interpret the final phase of one of these sessions?

John Bailey: Well, in the early ones, I think it was socio-economic presentation, we asked specific questions, and then we stopped. And we had a real large discussion back and forth amongst the Task Force members, and the public also got into that. I think maybe we all had a better sense of the topic; we had our own view of the social and economics and were tied in to it better. So maybe that's the reason it worked then. But one of the things we said we wanted was open discussion, issues, comments, and for concerns to be raised and recorded. So, I haven't seen us doing that part in the last two meetings. And tonight, there was really no discussion, there's been a little bit, but very little amongst the Task Force members. Until we start discussing things, we don't really know where we are. But, I don't know, my question is I'm listening to this and I'm not sure these rules are working the way we wanted them to. That's why I brought it up. I haven't cut these questions off because I haven't heard one that was bad. I think they're very important. And it seems like it's taking a longer process. Maybe we have to have an open discussion following, I don't know, but it doesn't seem like it's working. As your Chair, I'm concerned. Any one of you could be coming up here and complaining to me that we're not following them.

Andy Dana: There's a tension between the need to process the information and to at least discuss what we've heard; at least get the Task Force interacting as we receive data. The rules were devised, I think, as I recall, to try and balance that tension, to balance and construct them in a way, and we should be listening to the rules. I'm not convinced it has been constructive in the wrong way, basically because we haven't really had a serious discussion among the Task Force for the last couple of meetings as you've said. So we don't know if the process is working.

John Bailey: It's not working because we're not having the following discussion.

Andy Dana: In the first couple of meetings, you conducted the meeting and you said this is the process, this is what we're going to do, and we followed those rules. The last couple of meetings we haven't done that.

John Bailey: Like I say if we're now going into general discussion area, and the first things out are questions to the researchers.

Bob Wiltshire: No, I think John, the first thing that comes out is dead silence. I just think that, especially the socio-economic, and Jerry alluded to it, we had a whole different realm there. We were in something that didn't as much build into the other studies, it wasn't a scientific presentation.

John Bailey: What?

Bob Wiltshire: I'm sorry, it wasn't the same type of scientific presentation. When I'm hearing these reports, I don't know, this is what you get. I don't have a strong concern or thought. I've just heard a large amount of information, data, being presented to me. I need some time to assimilate that. If I have something that sticks in my craw, I'm going to say it.

Andy Dana: Just to play devil's advocate, does it help you assimilate to talk about some of the interesting data that you were presented, and to hear what Brant found interesting, or Doug, or someone? I mean that's the purpose of the discussion in my mind.

Bob Wiltshire: Okay.

Andy Dana: It'll help assimilate it.

Brant Oswald: I hate to be the person to say it, but I would hate to cut down the questions and answers that we've done tonight. So we may need longer meetings or different meetings. But it seems like to me that, maybe we could get together for lunch next week. I think having some time to assimilate would help. And one of the things that Doug and I have been talking about a little bit here too, and I brought it up at the meeting when I was confused by the rulemaking that we were doing, is I think it also helps to be able to talk to our constituencies. And I don't mind being able to leave this meeting and talk to some other people in the

conservation community and hear some concerns and what they found interesting and bring that to the discussion.

Andy Dana: There's nothing that prevents you from doing that when we get out of the discussion part of the presentation.

Brant Oswald: Okay.

John Bailey: Ellen, what do you think?

Ellen Woodbury: I think that the more we hear, the more we realize that all of this is interrelated and it's very difficult to come up with any kind of recommendations until you have been presented everything. I thought that all along, that it's going to be very difficult to make recommendations on one presentation. Because it was very obvious that what we heard here tonight, and what we hear at the next meeting, everything is interrelated so there is no way that we should be making any kind of a judgment on one presentation.

Andy Dana: The purpose is not to make recommendations here—if we can great—but it's to raise issues that we might need to think about when we develop recommendations the next time. I mean that's not the purpose.

Ellen Woodbury: Well, what type of issues are you talking about? With the data, or issues with other things. Well I guess I don't think that we can have, or I think it is very difficult to have, concerns with that list of topics of concerns without having everything in front of you. I don't think that you can take just this study and have concerns.

Robert Ray: I agree with you.

Andy Dana: I totally agree with that. You can have concerns, you can have issues, we can have preliminary recommendations. Those concerns, those issues, those things that'll immediately strike you, if not for a discussion like this, are things that maybe we want to talk about when we're developing recommendations. And to get them down for the record now will help refresh our recollections four months from now. This is the initial, visceral reaction to this data that was presented, when we have the researchers here.

Ellen Woodbury: And what my initial, visceral reaction is, that I want to hear what the next guy has to say, and the next guy. And I'm more than willing to stick around and ask all the questions of these researchers.

Andy Dana: I guess I'm outnumbered.

John Bailey: So you're suggesting we change the ground rules, Ellen?

Ellen Woodbury: It probably wouldn't be a bad idea.

Jerry O'Hair: I'm going to try something. I have concerns about cottonwoods and I have always had concerns about cottonwoods because they are valuable to my operation. And, after the floods of 1996 and 1997, I even had more concerns with the fact that I was told that I needed the cottonwood and riparian area to protect your property and riverbed and so on and so forth. And there were thousands of them on my property. In looking back almost 100 years ago now, on my particular property, that land down there was pretty much devoid of cottonwoods, now I think there's more cottonwoods and other willows and so forth. And I wonder why that is, why there could be more? So along with management decisions I guess I'm looking for some sort of a management situation in which I can maintain cottonwoods, not only cottonwoods but other riparian trees, and I guess it is one of the recommendations I would make would be: take fur – everybody needs a fur coat for their wife, until we run out of beavers.

John Bailey: You had me confused for a minute. But now you've made what this whole session is supposed to be, comments, concerns, things that we may want to see. Thank you, yes.

Andy Dana: I've got another one. It seems to me that, what I heard was that clonal reproduction is important, and that bank stabilization doesn't necessarily eliminate clonal reproduction, but also natural seed reproduction is important as well, and probably very important to maintaining the genetic diversity of the cottonwood stands.

And if we're coming up on recommendations on bank stabilization, we need to find a way to find out what bank stabilization structures can strike a balance between those two. That's not brain surgery. It's easy to make a comment like that; we might hear something different in the future and we can strike that.

Roy Aserlind: Well, if I could mention another concern. As you know, the Corps of Engineers lost a suit. And as part of the settlement, they came to my property and said that I have to plant ten cottonwoods, and the person came over and we looked at the property and I said, "this is it, this is what we've got". Well, let's plant them here. So I planted ten cottonwoods, nine of them were scoured out by the high water this year, and it was only 14,000 cfs. Now, am I going to get sued by them Corps because these plants are gone, because I didn't get an 80 percent survival rate? They didn't grow a certain way? What can I do?

Andy Dana: We've got 3,000 that died by drought on my property.

Roy Aserlind: On our property, in 40 years, we've never lost one cottonwood to flooding or to drought, but we have lost 14 (out of a relatively small supply) to beavers. Can I shoot a beaver? No. So, there's a concern, but what can I do about it?

John Bailey: But is it one of the concerns, one of the things they're lacking in all our studies, is any information about beavers. We have nothing in any study looking at the dynamics of beavers.

Roy Aserlind: Well, I know, I think if you really floated down the river, there are stretches there I can count 100 downed cottonwoods. On our little island, just north of us, they're losing all the big cottonwoods to beavers.

Andy Dana: In our recorded history, we have no idea what—if there is a dynamic equilibrium, which I guess there isn't—the beavers did on the Yellowstone, because our recorded history begins with the trapping of beavers.

Roy Aserlind: I think they've had natural predators for many, many years too, but now man is the only predator, and he/she can't shoot them.

Dave Haug: That's part of the study we're going into right now, is cottonwoods. So maybe this should be a point that we should bring back to the TAC and the researchers and have them address; because this clearly is a fact of life, what they do, and how they're affecting the cottonwoods.

Roy Aserlind: For me, yes, a big fact of life. One swam by the house just yesterday.

Brant Oswald: John, I would like to come back to the procedural stuff. It seems to me that the one thing that's necessary is to attend this extra half hour at the end of the meeting, where you do need to bang a gavel at some point, not to shut the questions off, but still, at some point, make time for the sort of discussion we're having now.

John Bailey: My sense, and it's a very strange one, is that there's a formal presentation and people don't want to ask the questions. And then if the presenters sit down, the questions just pour out. It seems like we have a very strange thing happening here; I don't know what it is. It didn't happen on the socio-economic, because everybody got it, they had at it, we had questions like crazy, and then we had a great discussion. But for these other presentations, I don't know if it's because we lack the knowledge, or it's so new. I know that a lot of times with new data, I actually need days to think about it, and I start relating things to it, and I can ask better questions. So, I'm not surprised that this is happening, but it's not the rules that we agreed to abide by, and that's my concern, and I just feel that criticism is due, and that's why I brought it up.

Roy Aserlind: Could it have been partly, as far as I know, the socio-economic is the only one that had a subcommittee dedicated to that one question. Now, perhaps there are subcommittees for the other the major researches. But we had a subcommittee, actually chaired by Dave Haug, and we talked, and we came up with a number of research questions. And perhaps one of the reasons that the socio-economic did generate discussion. And of course, we're all interested in the dollars too.

John Bailey: My sense is that we've gone away from the last few meetings and we weren't having good comments.

Roy Aserlind: Yes. Well, they were excellent.

John Bailey: They just started coming.
Okay. At our next meeting I will give you a lecture about comments and discussion.

Bob Wiltshire: The other thing that happened tonight is we had a larger audience, and I don't think they're going to get smaller, and we're going to be faced with more people that want to ask questions.

John Bailey: Most of the questions came from Task Force members.

Bob Wiltshire: Right.

Roy Aserlind: And they had good questions.

Bob Wiltshire: That's true.

John Bailey: Can we move on? Because we might be here until midnight.

V. Other Business

1. *2002 Annual Report*

John Bailey: We were given a draft of the *2002 Annual Report* at our last meeting.

Bob Wiltshire: Well, I read it.

John Bailey: Now, we can have another meeting if you like, to spend a lot of time on this. I'm happy to schedule one on Thursday, or whatever you'd like to do, but we need some direction tonight. I don't know if people have comments or not. Do you want to move forward with it or what?

Bob Wiltshire: Well, I read it.

John Bailey: And? What are your comments?

Bob Wiltshire: The only thing, I had no problem, I have to admit I didn't read it all, I read the underlined sections. Thank you. And the only section that I wanted to mention was where Liz had highlighted and asked about where we have a couple of former Task Force members, and whether or not to keep them listed in the profiles of Task Force members. And I was wondering about maybe moving them to the bottom of the list and putting a little line across and just putting "former members", instead of just dropping them completely off. That is the sum total of my comments.

John Bailey: Other comments? I had one, Liz. You list Christie Todd Whitman but you don't give her a title. It's on page 36.

Liz Galli-Noble: Thank you. I was trying to be brief. I will add her title.

John Bailey: Well, I think that she needs a title. You're assuming everyone knows her. There will be some that don't. Is there anyone who might want to make a motion on this thing, or do you want another meeting?

> **Ellen Woodbury moved to approve the 2002 Annual Report with the two edits outlined. Bob Wiltshire seconded the motion. The motion passed unanimously.**

John Bailey: Do you understand Liz?

Liz Galli-Noble: Yes.

John Bailey: Thank you. Any final additions and/or edits made to the annual report I will check before we send it to the Governor.

2. Steps for Formal Action on Task Force Recommendations (review draft)

The only other issue that we keep postponing is the Steps for Formal Action on the Task Force Recommendations, and it would be my recommendation postponing it because I think we're having trouble with what we're doing now. I actually think, and the reason I wanted to bring it up, is because I think we're evolving as a group and I think we need to continue to do so before taking this issue on. I think that one of the reasons this has changed is that there is a lot of trust between the Task Force members, that we're not so worried about somebody getting off on some tangent, anymore. And I think some of these rules were developed to avoid things like that. Concerning discussion, we're going to have to have a lot of discussion. I think that the more we have early-on is going to certainly help us when we really get to the recommendation process. So, if there's nothing else…anybody have another comment?

Bill Moser: The Governor didn't start this Task Force because of the trees, or the drought, or the birds, or whatever. The Governor started this Task Force because the river flooded. And discussion-wise, recommendation-wise, every culture in history has used the floods to replenish the nutrients in the ground, and so, recommendation-wise down the road somewhere, it would be nice if there were two or three more ditches higher up the valley that you could pump the crap out of during flood season. If you did it sufficiently, you would lower the velocity of the river, you would lower the queue on the river, and, as Chuck and these other people have all said outside of this meeting, everything that gets pumped into irrigation in the Paradise Valley is going to end up back in the Yellowstone River at Rock Canyon. So what you're doing is, you're taking a peak flood period and irrigating it out over crop land and agricultural land and slowing it's process back to Rock Canyon by two or three weeks, which distributes the flow of the river. It cuts the erosion, whatever, and so, discussion-wise, it would be nice to see some discussion about adding some more ditches and then using those ditches in the flood season to irrigate much higher up on the ground, and then let the hydrology bring the water back to the river three weeks after flood stage. This is just discussion.

John Bailey: Well, I know why the Governor appointed the Task Force. I mean, I'm the instigator in this artifact. But the last time I heard "building a new ditch" from Paradise Valley and it actually was started, was to run the water down the divide to Glendive, so I don't think that solves the problem and I think if you're looking for the money to pay for it, you're going to have a lot of land to irrigate, and you can't get that much in the valley, because you can't get the water high enough without big pumps. So, you want to be careful or your water will be in Glendive. There was a deal, to run it right down the divide, on the north side of the Yellowstone, to Glendive. Of course we needed a dam to do it too, so, that'll really change the river. I understand what you're saying, but I wanted to bring in some history there.
We have yet to see the fisheries studies. I think we're going to see some other things that will show us more dynamics. I think that's one of the reasons we're not having comments is everyone realizes that until we've seen some of these studies, you're almost afraid to say something prematurely, and I understand that. Anyway, we're adjourned, and we'll be meeting again in two weeks: Tuesday, January 21 with the Fish Populations Study team.

Tuesday, January 21st, 2003, Fish Population Study
Location: Yellowstone Inn

Tuesday, February 11th, 2003, Wildlife Study
Location: Yellowstone Inn

Tuesday, February 25th, 2003, Fish Habitat Study
Location: Yellowstone Inn

Tuesday, March 25th, 2003, Historic Watershed Land Use Study
Location: Yellowstone Inn

VI. The meeting was adjourned at 10:15 p.m.